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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/753,885	01/07/2004	Jyrki Mikkola	02709/0200717-US0	6893
7278	7590	04/18/2006	EXAMINER	
DARBY & DARBY P.C. P. O. BOX 5257 NEW YORK, NY 10150-5257			LIE, ANGELA M	
			ART UNIT	PAPER NUMBER
			2821	

DATE MAILED: 04/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/753,885

Applicant(s)

MIKKOLA, JYRKI

Examiner

Angela M. Lie

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2006.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☒ Claim(s) 14 is/are allowed.  
6) ☒ Claim(s) 1,2,5-9 and 11-13 is/are rejected.  
7) ☒ Claim(s) 3,4 and 10 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 04 August 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1,2,8 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Tarvas et al (US Patent 6252552).

As to claims 1 and 13, Tarvas et al disclose a planar antenna structure for a radio device having at least one operating band comprising: a ground plane (Figure 11a, element 1107); a radiating element (Figure 11a, element 1101) galvanically isolated from other conductive parts of the radio device (Column 1, lines 43-46); a feed element (Figure 11a, element 1108) having an antenna feed point (Figure 12, elements 1206 and 1208), wherein the feed element is only electromagnetically coupled (column 1, lines 43-46) to the radiating element (Figure 12, element 1203) so as to transfer energy to the radiating element and receive energy from the radiating element; and a feed circuit (Figure 12, element 1207 and Figure 13) that couples the antenna feed point (Figure 12, elements 1206 and 1208) to an antenna port (Figure 12, element 1209) of the radio device, the feed circuit includes a reactive component and also couples the antenna feed point to the ground plane; whereby said at least one operating band is set

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to a desired range on the frequency axis and to match the antenna (column 1, lines 65-67).

As to claim 2, Tarvas et al disclose a planar antenna wherein the feed circuit comprises a feed circuit board between the feed element and the ground plane (column 7 lines 8-16, in lines 13 it is written that feed element comprises a microstrip on the surface of the connector block, this is interpreted as being a circuit board, connector is a rigid piece and it forms board while a microstrip is a part of feed circuit, so that feed circuit board is indeed placed between the feed element and the ground plane).

As to claim 8, Tarvas et al teach a planar antenna structure comprising a dielectric layer (Figure 7, element 701) above the ground plane (Figure 7, element 703), the dielectric layer including a radiating element (Figure 7, element 702) on surface of the dielectric layer and a feed element (Figure 7, element 705) on the opposing surface thereof (as shown in figure 7).

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 5-7, 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tarvas et al (US 6252552) in the view of Kaiponen (US 6469673).

As to claim 5, Tarvas et al disclose all the limitations presented in claim 1, they do not teach however that the radiating element, when installed, follows the contours of the outer surface of the radio device as regards its shape and position. Kaiponen teaches the antenna for the cellular phone following the contour of the outer surface of the radio device(Figure 2, element 103a; as shown in figure 2, element 106, note that in specification this element corresponds to the number 206). It would have been obvious to one of the ordinary skill in the art during the time when the invention was made to incorporate Kaiponen's placement of a radiating element in such a way that it follows the shape of a surface of the radio device, into the antenna as described in claim 1, because if the radiating element follows the shape of surface of the radio device, it would be one of the most efficient ways of using the space inside the radio device, and while keeping size of the device relatively small, radiating plane could still have relatively large radiating area what would lead to better radiation and receiving of a signal.

As to claim 6, Tarvas et al and Kaiponen teach all the limitations presented in claim 5. Kaiponen teaches also that the radiating element is a rigid conductive piece belonging to a cover of the radio device (as shown in figure 2, Kaiponen does not explicitly state that radiating element is a rigid component and that it is conductive, however the fact that radiating element is conductive is an inherent feature, because the radiating element in order to radiate it has to be conductive, and in regard to radiating element is rigid, it is also obvious from the figure 2, because if radiating element (Figure 2 element 106) would not be rigid, it could not be placed in parallel with ground plane

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and stay separated by itself because it would unstable). The radiating element also belongs to a cover of radio device (as shown in figure 2, element 106, 103a and 103b).

As to claim 7, Tarvas et al and Kaiponen teach all the limitations presented in claim 6, Tarvas et al also teach that the conductive piece is an extrusion piece (column 8 lines 1-4, it is mentioned in this paragraph that radiating element can be a curved piece, therefore in order to make that shape it had to be extruded, if the extrusion is understood as one piece element, it is also shown in figure 11a that radiating element is one piece element).

As to claim 9, Tarvas et al teach all the limitation presented in claim 8, they do not teach however that plate formed by (understood as plate comprising) the dielectric layer, radiating element and feed element are arranged to be attached to an inner surface of a non-conductive cover of the radio device. Kaiponen teaches an arrangement in which all the part of the antenna listed above is attached to the non-conductive portion of the radio device (column 2 lines 2-26). It would have been obvious to one of the ordinary skill in the art during the time when the invention was made to mount the antenna as described by Tarvas et al by attaching it to an inner surface of a non-conductive cover as taught by Kaiponen, because placing antenna inside the housing definitely protects it from being broken or destroyed, and further the inner surface of the case should be non-conductive because a radiating element in the antenna should not touch the conductor since that could cause degradation in the signal and even shortage (column 2 lines 24-16).

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As to claim 11, Tarvas et al and Kaiponen teach all the limitations presented in claim 5. Kaiponen also teaches at least one of the radiating element (Figure 2 element 106) and feed element (Figure 2 element 207) being located inside the cover of the radio device (Figure 2 elements 103b and 103a).

5. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tarvas et al (US 6252552) in the view of Tarvas et al (US 6759989). Tarvas et al and McNamara teach all the limitations presented in claim 1, they do not teach however that the planar further comprising at least one radiating parasitic element. Tarvas et al (US 6759989) teach placing a parasitic element to improve upper operating band. It would have been obvious to one of the ordinary skill in the art during the time when the invention was made to incorporate Tarvas et al teaching and place a parasitic antenna in the antenna setup described in claim 1, because parasitic antenna increases the width of radiation and therefore it improves upper operating band and the overall signal coverage is better (US 6759989 column 1, lines 52-67 and column 2 lines 1-7).

***Allowable Subject Matter***

6. Claims 3,4 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. Claim 14 is allowed.

8. The following is a statement of reasons for the indication of allowable subject matter:

As to claim 3, the prior art fails to teach the planar antenna as disclosed in claim 2 wherein the feed circuit board comprises a feed conductor which galvanically connects the feed point to the antenna port; and a ground conductor which electromagnetically connects the feed conductor to the ground plane at a point along the feed conductor.

As to claim 4, the prior art fails to teach the feed conductor and ground conductor are meandering strip conductors, as clearly described in the body of claim 4

As to claim 10, the prior art fails to teach the radiating element being a conductive layer on an outer surface of the cover of the radio device as clearly described in the body of claim 10.

As to claim 14, the prior art fails to teach a planar antenna structure as disclosed in claim 14, having the feed circuit board including a feed conductor and a ground conductor, wherein the feed conductor and the ground conductor are meandering strip conductors.

### ***Response to Arguments***

9. Applicant's arguments filed on February 9, 2006 have been fully considered and the arguments pertinent to claims 1, 13, 5-7, 9 and 11-12 are not persuasive and the arguments pertinent to claims 3 and 14 are persuasive and therefore rejection of those two claims has been withdrawn.

10. With respect to the applicant's assertion on page 7, last paragraph, stating that Tarvas et al do not teach a radiating element galvanically isolated from the other



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conductive parts of the radio device, the examiner disagrees with that statement. Feed conductor can be considered a conductive part of the radio device, and as disclosed in column 7, lines 8-14, part of connection of the feedpoint to the antenna port is a coupling through the printed circuit board, interpreted as galvanically isolated since electrical contact is not formed.

11. Furthermore, the applicant argues that Tärvas et al do not teach the feed circuit including a reactive component. The examiner disagrees with this statement. Even though Tarvas et al do not teach the antenna having inductor as one of its structural elements per se, they clearly disclose that feedline shows inductive behavior; therefore it can be considered as reactive component (column 7, lines 22-30). The applicant states that Tarvas et al show figure 13, just to illustrate an equivalent circuit to the structure of the antenna. The examiner agrees with this phrase, however the applicant's arguments regarding this matter do not appear to be valid because claims teaching the structure comprising reactive elements, lack detailed description of what those elements should be. Therefore the rejection regarding this matter is proper.

12. With respect to the applicant's assertion made on page 10, the second and last paragraphs, the examiner would like to note that the applicant did not clearly specify which features were not suggested or described in the references. The examiner believes that all the dependent claims rejected under 35 U.S.C 103(a) are proper because the references combined teach all the limitations disclosed in claims 5-7, 9 and 11-12, furthermore the probability of success of combining those two references is

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sufficient and motivation for combining the elements is also given, therefore a prima facie case of obviousness is established.

### ***The Prior Art***

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- US 6683573 discloses a multi band chip antenna with dual feeding ports, it does not talk about feed circuit board
- US 2002/0089453 discloses a multi frequency band antenna
- US 5926139 discloses a planar dual frequency band antenna
- US 6404394 discloses a dual polarization slot antenna assembly

### ***Inquiry***

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela M. Lie whose telephone number is 571-272-8445. The examiner can normally be reached on M-F.

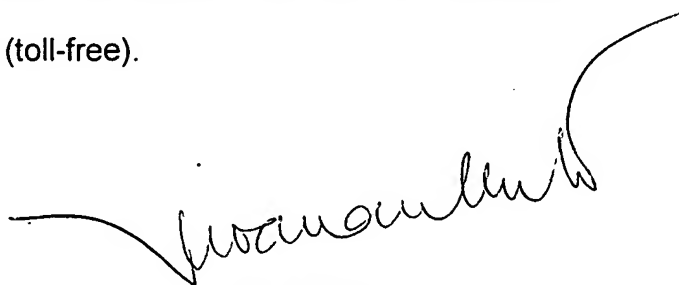
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong can be reached on 571-272-1834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



**Angela M Lie**



**Hoanganh Le**  
**Primary Examiner**